United Nations ST/SG/AC.10/C.3/2018/56

Secretariat

Distr.: General
6 April 2018
English
Original: French

Committee of Experts on the Transport of Dangerous Goods and on the Globally Harmonized System of Classification and Labelling of Chemicals

Sub-Committee of Experts on the Transport of Dangerous Goods

Fifty-third session
Geneva, 25 June–4 July 2018
Item 6 (d) of the provisional agenda
Miscellaneous proposals for amendments to the Model Regulations on the Transport of Dangerous Goods:
Other miscellaneous proposals

Use of the terms "conductivity" and "conductance" in chapter 6.7

Submitted by the expert from France*

Introduction

1. In 6.7.2.12.2.1 and 6.7.3.8.1.1 the term "U" is defined as follows in the French and English versions respectively:

"U = conductivité thermique de l'isolation à 38°C exprimée en kW.m^{-2}.K^{-1}"

"U = thermal conductance of the insulation, in kW.m^{-2}.K^{-1}, at 38°"

2. The term "*conductivité*" used in the French version is incorrect. Conductivity is measured in kW.m^{-1}.K^{-1}. Our first thought was to propose bringing the French version into line with the English text by using the French term "*conductance*". However, the difference between the two language versions seems to hide a more basic problem.

3. In general scientific usage conductance is expressed in kW.K^{-1}, and is not a surface factor. The correct term for the unit given is "heat transfer coefficient" (in French "*coefficient de transfert thermique*"). This coefficient is expressed in kW.m^{-2}.K^{-1} when it is a surface factor, as is the case here, and is denoted by U. Conductance is denoted by UA and is the result of multiplying the factor by the surface. Nevertheless, in principle the SI unit for conductance is usually kW.K^{-1} rather than kW.m^{-2}.K^{-1}.

* In accordance with the programme of work of the Sub-Committee for the biennium 2017–2018 approved by the Committee at its eighth session (see ST/SG/AC.10/C.3/100, para. 98, and ST/SG/AC.10/44, para. 14).

4. It appears, however, that the ASTM standard C168-15 equates heat transfer coefficient with conductance and defines the unit of measurement as $kW.m^{-2}.K^{-1}$. This may explain why this is the term used in the English version.

5. It would seem to be clearer to use the term "heat transfer coefficient" in all the language versions.

Proposal

6. In 6.7.2.12.2.1 and 6.7.3.8.1.1 amend the definition of the factor "U" to read:

In French:

"U = coefficient de transfert thermique de l'isolation à 38°C exprimée en $kW.m^{-2}.K^{-1}$"

In English:

"U = heat transfer coefficient of the insulation, in kW·m-2·K-1, at 38°"

Action to be taken

7. The expert from France invites the Sub-Committee to check his analysis and take the appropriate decisions.

8. Should the use of the term "heat transfer coefficient" not be deemed appropriate, it would still be necessary at the very least to amend the French version of the text using the word "*conductance*" instead of "*conductivité*", and to check the other language versions. In that case it would be wise to state that the term "conductance" was being used with the meaning given in the ASTM standard mentioned above.